

What Is Claimed Is:

1. Diode-pumped solid-state laser having at least one intracavity positioned laser crystal (6) having at least one optical axis longitudinally to which at least one pumped-light beam emitted from at least one pumped-light source (7,8) is incident on said laser crystal (6),
wherein said pumped-light beam has a beam diameter corresponding to at least 1.25 times the beam cross section of a laser beam forming inside the resonator (R) with the oscillation mode TEM₀₀.
2. The diode-pumped solid-state laser according to claim 1,
wherein the emerging laser beam possesses a beam quality of $M^2 \geq 1.8$.
3. The diode-pumped solid-state laser according to claims 1 or 2,
wherein said TEM₀₀ mode beam diameter is defined by the mirror radii of the resonator mirrors (1,2), the length of said resonator, and said intracavity positioning of said laser crystal (6), and
said beam diameter of said pumped-light beam is adjustable by means of an imaging optic (11).
4. The diode-pumped solid-state laser according to one of the claims 1 to 3,
wherein an intracavity quality switch (3) in form of an acousto-optical or an electro-optical Q-switch is provided.
5. The diode-pumped solid-state laser according to one of the claims 1 to 4,
wherein said asymmetrical optical resonator (R) has a convex-plane, convex-concave or convex-convex resonator construction.
6. The diode-pumped solid-state laser according to one of the claims 1 to 5,
wherein said laser crystal (6) is doped with one or a multiplicity of the following doping substances: Nd, Yb, Cr, Tm, Ho or Er.

7. The diode-pumped solid-state laser according to claim 6,
wherein said laser crystal comprises of the following crystals: Nd:YAG, Nd:YVO₄, Nd:YLF, Nd:GVO₄, Nd:YPO₄, Nd:BEL, Nd:YALO, Nd:LSB, Yb:YAG, Yb:FAB, Cr:LiSAF, Cr:LiCAF, Cr:LiSGAF, Cr:YAG, Tm-Ho:YAG, Tm-Ho:YLF, Er:YAG, Er:YLF or Er:GSGG.
8. The diode-pumped solid-state laser according to one of the claims 1 to 6,
wherein at least one of said pumped-light beams has a power of at least 5 Watt, preferably between 10 and 60 Watt.
9. Use of the diode-pumped solid-state laser according to one of the claims 1 to 7 for material processing, preferably for surface processing, such as surface material removal, surface modification, sintering, melting or preferably to process volume material, such as selectively cracking.